

AMENDMENT CLAIMS UNDER ARTICLE 19(1) (RULE 46)

1. (Amended) A double side polishing method for at least automatically rotating a plurality of carriers holding works to be polished, between an upper and a lower rotary surface plates to simultaneously polish both surfaces of a plurality of works held by the plurality of carriers,

~~characterized by comprising the steps of:~~

merging each work with the carrier before supplying the work onto the lower surface plate; and

supplying the work merged with the carrier, onto the lower surface plate in a merged state,

such that
in which when the work merged with the carrier is supplied to the lower surface plate, an indexing operation of rotating the lower surface plate through a predetermined angle for each operation is performed to supply the work and carrier to their specified position, and the operation of indexing the lower surface plate is performed so as not to cause carriers already placed on the lower surface plate to move relative to the lower surface plate.

2. The double side polishing method according to claim 1, *wherein* ~~characterized in that~~ a polished work is ejected from the lower surface plate separately from the carrier or while remaining merged therewith.

3. (Deleted)

4. (Deleted)

5. (Amended) A double side polishing apparatus, ~~characterized by comprising:~~

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a polishing apparatus main body for at least automatically rotating a plurality of carriers holding works to be polished, between an upper and a lower rotary surface plates to simultaneously polish both surfaces of a plurality of works held by the plurality of carriers;

a merging mechanism for merging each work with the carrier outside the polishing apparatus main body; and

a supply mechanism for supplying the work merged with the carrier outside the polishing apparatus main body, to the lower surface plate in a merged state, said merging mechanism comprises:

a first aligning mechanism for aligning the carrier;

a second aligning mechanism for aligning the work before merging it with the carrier; and

a conveying mechanism for conveying the aligned work into the aligned carrier.

6. The double side polishing apparatus according to Claim 5, *wherein* characterized in that said supply mechanism also acts as an ejection mechanism for ejecting the work polished on the lower surface plate to an exterior of the polishing apparatus main body while remaining merged with the carrier.

7. (Deleted)

8. (Amended) A double side polishing method for at least automatically rotating a plurality of carriers holding works to be polished, between an upper and a lower rotary surface plates to simultaneously polish both surfaces of a plurality

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of works held by the plurality of carriers, ~~characterized by~~ comprising ~~the steps of~~:

providing a plurality of fluid nozzles in the lower rotary surface plate opposite to the plurality of works between the rotary surface plates, the nozzles being opened in a surface of the surface plate, and on separating the upper and lower rotary surface plates from each other after double side polishing has been completed between the upper and lower rotary surface plates; and

causing the lower fluid nozzles to suck the plurality of works in order to hold them on the lower rotary surface plate.

9. (Amended) The double side polishing method according to Claim 8, ~~wherein~~ ^{wherein} ~~characterized in that~~ the plurality of fluid nozzles opened in the surface of the surface plate are provided in the upper rotary surface plate so that when the upper and lower rotary surface plates separate from each other, a liquid is injected from the fluid nozzles provided in the upper rotary surface plate.

10. (Amended) A double side polishing apparatus ~~characterized by~~ comprising a polishing apparatus main body for at least automatically rotating a plurality of carriers holding works to be polished, between an upper and a lower rotary surface plates to simultaneously polish both surfaces of a plurality of works held by the plurality of carriers, in which a plurality of fluid nozzles are provided in the lower rotary surface plate opposite to the plurality of works between

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the rotary surface plates, the nozzles being opened in a surface of the surface plate, and the plurality of fluid nozzles provided in the lower rotary surface plate are connected to a suction mechanism.

11. (Amended) The double side polishing apparatus according to Claim 10, wherein characterized in that the plurality of fluid nozzles opened in the surface of the surface plate are provided in the upper rotary surface plate and connected to a liquid supply mechanism.

12. A double side polishing apparatus, characterized by comprising:

a polishing apparatus main body for at least rotating a plurality of carriers holding works to be polished, between an upper and a lower rotary surface plates to simultaneously polish both surfaces of a plurality of works held by the plurality of carriers;

a housing section arranged between the upper and lower rotary surface plates instead of the plurality of carriers and at least auto rotating between the upper and lower rotary surface plates similarly to the carriers to house a plurality of processing bodies for processing polishing cloths installed on opposite surfaces of the upper and lower rotary surface plates; and

a conveying section for supplying the plurality of processing bodies between the upper and lower rotary surface plates from the housing section and ejecting the used

processing bodies from between the upper and lower rotary surface plates.

13. The double side polishing apparatus according to *wherein* Claim 12, ~~characterized in that~~ said processing bodies are brushes that clean the polishing clothes and/or dressers that level them.

14. The double side polishing apparatus according to *wherein* Claim 12, ~~characterized in that~~ said conveying section is also used as a work conveying section for supplying unpolished works between the upper and lower rotary surface plates and ejecting polished works from between the upper and lower rotary surface plates.

15. The double side polishing apparatus according to *wherein* Claims 5, ~~10, and 12~~ ~~characterized in that~~ the polishing apparatus main body ~~comprising~~ *comprises*:

a pair of rotary surface plates for polishing both surfaces of the works;

a plurality of gear-shaped carriers arranged in a periphery of a rotation center between the pair of rotary surface plates to eccentrically hold the works;

a center gear arranged in the rotation center between the pair of rotary surface plates to engage with the plurality of carriers arranged in the periphery to synchronously rotate them automatically; and

a plurality of auto rotation means distributed around the plurality of carriers so as to correspond to them and each engaging with the carrier located inside the rotation means

to hold and automatically rotate said carrier at its specified position in corporation with the center gear.

16. The double side polishing apparatus according to *wherein* Claim 15, ~~characterized in that~~ each of the auto rotation means engages with the carrier at one or two or more positions and has one or more rotary gears each having a tooth trace along a rotation axis thereof.

17. The double side polishing apparatus according to *wherein* Claim 16, ~~characterized in that~~ said rotary gear is movable in a rotation axis direction.

18. (Deleted)

19. (Deleted)

20. *Sub B37* The double side polishing apparatus according to *wherein* Claim 15, ~~characterized in that~~ each of the auto rotation means is configured to automatically rotate the carrier by means of a worm gear.

21. The double side polishing apparatus according to *wherein* Claim 20, ~~characterized in that~~ said worm gear is made of a resin.

22. The double side polishing apparatus according to *wherein* Claims 5, ¹⁰, and 12, ~~characterized in that~~ the polishing apparatus main body is based on a method of polishing both surfaces of the wafer held on each carrier by arranging the plurality of carriers holding the wafers between the upper and lower rotary surface plates at predetermined intervals in the rotation direction, and engaging each carrier with a sun gear located in the center of the surface plate and inner

gears located in a periphery thereof, to cause each carrier to make a planetary motion between the upper and lower rotary surface plates, and there are provided a plurality of supply passages of grinding liquid in the upper rotary surface plate for supplying grinding liquid between upper and lower rotary surface plates, and a sun gear is integrated at a central part of the lower rotary surface plate.

a 23. The double side polishing apparatus according to Claim 22, ~~wherein~~ characterized in that the upper rotary surface plate is rotationally driven independently of the lower rotary surface plate.

24. (Deleted)

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a 27. The double side polishing apparatus according to Claim 5, 10, or 12, characterized by comprising:

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a robot arm moving in at least two directions to transfer and load the wafers supported in a horizontal direction; and a top sucking chuck attached to the robot arm to suck a top surface of said wafer,

a in which the top sucking chuck is made of an outer-circumference annular sucking type that comes in contact with a top surface of a periphery of said wafer in the form of an annulus ring and that has a plurality of suction ports in the annular contact surface, the suction ports being formed in a circumferential direction at intervals.

a 28. The double side polishing apparatus according to
Claim 5, 10, or 12, characterized by comprising:

a robot arm moving in at least two directions to transfer
and load the wafers supported in a horizontal direction; and
a bottom sucking chuck attached to the robot arm to bear
said wafer from below while sucking a bottom surface thereof,

a in which the bottom sucking chuck is made of an
outer-circumference arc-shaped sucking type that comes in
contact with a circumferential part of a bottom surface of
a periphery of the wafer in the form of a circular arc and
that has a plurality of suction ports in the circular arc
contact surface, the suction ports being formed in a
circumferential direction at intervals.